
**ACOUSTIC AND MARINE SPECIES MONITORING PLAN FOR THE
NAVY'S IHA #3
FUEL PIER REPLACEMENT PROJECT AT
NAVAL BASE POINT LOMA**



Submitted to:

**Office of Protected Resources,
National Marine Fisheries Service,
National Oceanographic and Atmospheric Administration**

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For:

Naval Base Point Loma

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ACRONYMS

μPa	micropascal
APE	American Piledriving Equipment
dB	decibel(s)
EA	Environmental Assessment
ESA	Endangered Species Act
ft	feet
GPS	Global Positioning System
Hz	hertz
IHA	Incidental Harassment Authorization
IPP	Indicator Pile Program
kHz	kilohertz
LD	Larson Davis
LZ_{eq}	z-weighted sound levels
m	meters
MMO	Marine Mammal Observer
NAVFAC	Naval Facilities Engineering Command
NBPL	Naval Base Point Loma
NEPA	National Environmental Policy Act
NIST	National Institute of Standards and Technology
NMFS	National Marine Fisheries Service
re 1 μPa	referenced to one micropascal
rms	root mean square
SEL	sound exposure level
SLM	Sound Level Meter
SPAWAR	Space and Naval Warfare
SPL	sound pressure level
SSC	Systems Center
UW	University of Washington
V	volts
VM	Variable Moment
ZOI	zone of influence

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1 INTRODUCTION

1.1 Purpose of the Monitoring Plan

The purpose of this Monitoring Plan is to provide protocols for acoustic and marine species monitoring implemented during pile driving and demolition activities associated with 2015/2016 production pile driving and associated construction activities for Phase III of the Navy's Fuel Pier Replacement Project at Naval Base Point Loma (NBPL), California (Figure 1-1). The monitoring plan implemented during the 2014/2015 production pile driving followed the approved monitoring methodologies for both marine species and acoustic data collection described in the second-year National Marine Fisheries Service (NMFS) Incidental Harassment Authorization (IHA; Navy 2014). Some integrated adaptive changes to monitoring methods with respect to incidental species not covered in the second-year IHA were implemented during scheduled construction activities. This monitoring plan has been designed to avoid conflict with the many military and non-military activities that occur continually in San Diego Bay. Monitoring locations will avoid the federal navigation channel and other primary routes of vessel transit.

The components associated with the activities identified in the third-year IHA Application (Navy 2015) have been adjusted to account for modifications to acoustic data collection equipment and observation of marine mammal species identified during the first two IHAs, as well as changes to scheduled construction milestones. Based on modifications to the methodologies used during the previous monitoring of the pile removal and driving for the Fuel Pier Replacement project during the 2013/2014 Indicator Pile Program (IPP) and 2014/2015 production pile driving year, future acoustic monitoring methodologies will be implemented to achieve the following objectives:

1. Monitor 2015/2016 Fuel Pier in-water construction activities – Implement in-situ acoustic monitoring efforts to continue to measure sound pressure levels (SPL) from in-water construction activities not previously monitored or validated during the previous IHAs. Collect and evaluate acoustic sound record levels for five (5) piles of each fender pile size (18- and 24-inch);
2. Monitor demolition activities conducted adjacent to the fuel pier sufficient to validate source SPLs and associated acoustic zones of influence (ZOIs).
3. Monitor for the presence and behavior of marine mammals and other protected species during in-water construction activities to minimize impacts to marine species and effectively document marine species occurring within ZOI boundaries
4. Collect ambient underwater sound measurements in the absence of project activities to continue to validate the ambient baseline for the project area.

1 Marine mammal and other protected species monitoring will be conducted before, during, and
2 after pile driving and extraction activities within the appropriate ZOIs for potential injury and
3 behavioral disturbance thresholds. The proposed monitoring will enumerate the occurrence of
4 species in proximity to the project site and document the number of marine mammal species
5 exposed to underwater and airborne sound levels that would constitute “takes” under the Marine
6 Mammal Protection Act (MMPA). Endangered Species Act (ESA) listed species (e.g., California
7 least terns and green sea turtles) will also be monitored, as appropriate. As statistically robust
8 results from acoustic monitoring become available, marine species monitoring protocols based
9 on modeled ZOIs will be adjusted accordingly, and will be applied in the development of future
10 IHA Applications.

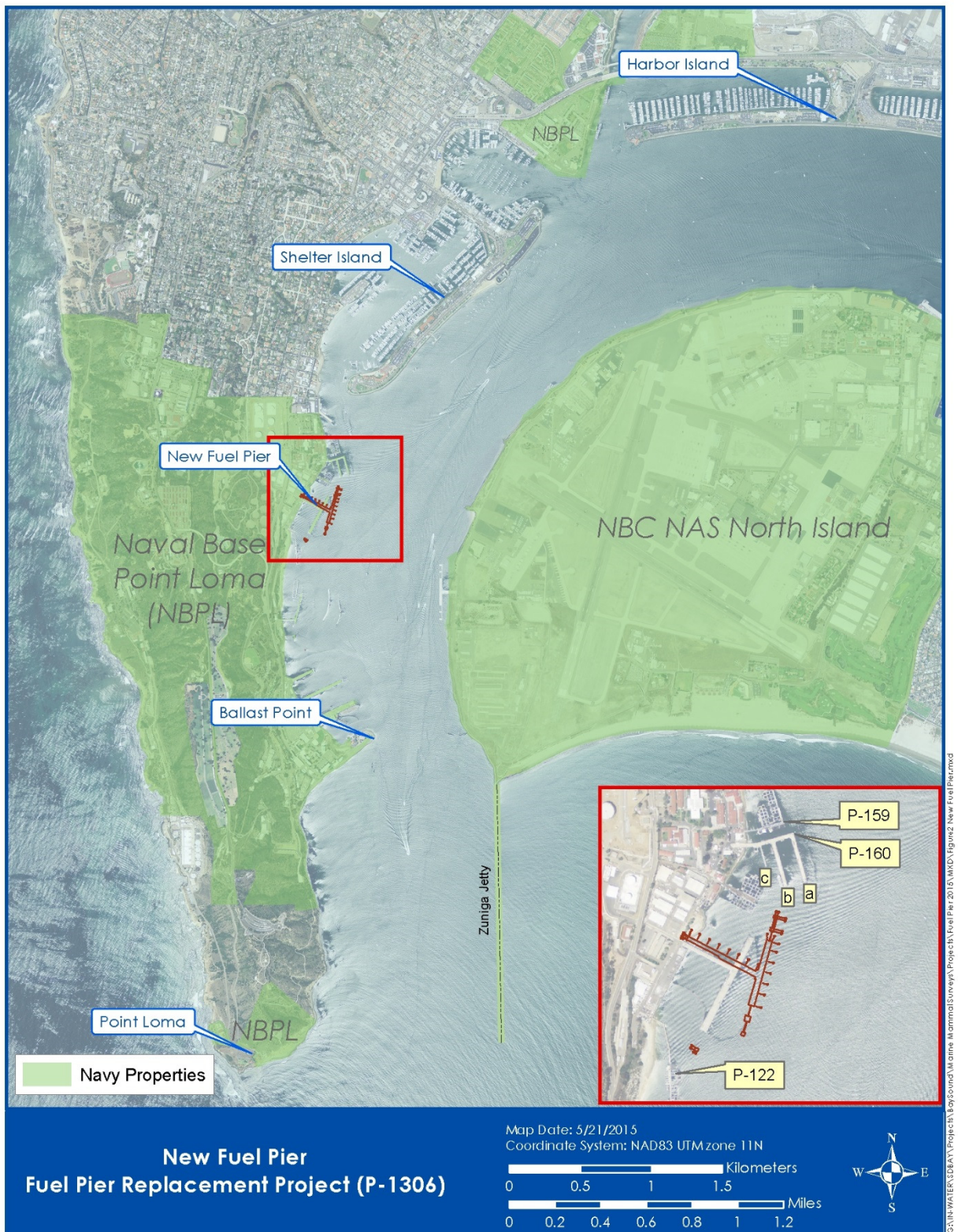


Figure 1-1. Regional Location – Fuel Pier Replacement Project, Naval Base Point Loma.

1.2 Scope and Timing

The scope of the Monitoring Plan includes pile driving and pile extraction activities for the 2015/2016 production efforts at the Navy's Fuel Pier Replacement Project. The scope of monitoring encompasses acoustics and marine species monitoring developed to comply with environmental monitoring mutually agreed upon as a result of the Navy's National Environmental Policy Act (NEPA) Environmental Assessment (EA) (Navy 2013b), or as a condition of approval by other regulatory agencies.

This Monitoring Plan will be implemented during IHA #3 period from October 8, 2015 through October 7, 2016 and will be managed by Naval Facilities Engineering Command (NAVFAC) Southwest. Acoustic and marine species monitoring will be carried out by private contractors supported by local technical staff from NAVFAC Southwest and the Space and Naval Warfare (SPAWAR) Systems Center (SSC) Pacific. NAVFAC Southwest personnel, contractor employees, and researchers from the University of Washington will also be responsible for preparation of the Monitoring Reports for all IHAs.

2 FUEL PIER REPLACEMENT PROJECT

2.1 Project Description

Refer to the EA (Navy 2013b) and IHA Applications (Navy 2013a, 2014a, 2015) for a full description of the Fuel Pier Replacement Project.

2.2 Project Area

The project area is in northern San Diego Bay and radiates outwards from the existing fuel pier (P-180) on NBPL (see Figure 1-1). These areas will be monitored both acoustically and for the presence/absence of marine species (marine mammals, green sea turtles, and California least terns).

2.3 Construction and Demolition-related Activities

Table 2-1 presents an amended summary of the in-water demolition and construction activities during the time frame covered by the 2015/2016 IHA. Due to accelerated production pile driving completed during the 2014/2015 production year covered by the second-year IHA (Navy 2014), a greater number of piles were driven during the second-year IHA timeframe than was described in the EA (Navy 2013b). Table 2-1 provides the anticipated number of piles to be driven and removed during the 2015/2016 production pile driving year based on the submitted pile driving plan provided by the construction contractor and approved by the Navy. Descriptions of pile installation, removal and demolition activities are provided in the IHA Applications (Navy 2013a, 2014a, 2015).

2.4 Activities Monitored During this IHA Period

2.4.1 Pile Driving

Pile driving during the 2015/2016 will include the installation of six 30-inch steel batter piles and 220 concrete and composite fender piles ranging in size from 16- to 24 inches. The Navy estimates that the contractor will drive approximately one steel batter pile per day during the limited steel pile driving production phase of construction. Each steel pile is assumed to require up to two hours of driving with substantial time needed for adjustment and alignment of the hammer and a pile template used to guide the piles. The installation of steel batter piles will require extensive use of the vibratory hammer to initially set the piles, with impact pile driving utilized to complete the installation to the required depth. Fender piles of all sizes will be jetted or stabbed and driven with an impact hammer. Soft start¹ procedures will be employed only for

¹ Soft-start procedures, in which vibratory and impact driver energy levels are gradually increased, are believed to allow time for fish and wildlife to move away from the pile driving site before the highest noise levels are produced. For the Fuel Pier Replacement Project, there is a deviation from those methods typically requested by the NMFS which utilize one minute period between hammer blows for soft-start. Results from the Test Pile Program and EHW-1 project in Puget Sound indicated a one minute wait period may be too long between hammer blows; Longer

the steel pipe piles and not for fender piles, unless SPLs 10 m from the fender piles are found to exceed the 180 dB Level A marine mammal threshold. Amendments to the pile driving plan submitted by the contractor include plans to drive a total of 226 fender piles.

Pile driving for steel 30-inch and concrete fender piles will utilize a range of equipment, depending on several different factors (e.g., pile size or substrate). An American Pile driving Equipment (APE) Variable Moment 250 (model 250 VM; 2,389 kilo Newton drive force) vibratory driver will be utilized for all vibratory driving. Two impact hammers will be used during impact pile driving: 1) APE D80 (127,000 to 198,450 foot-pound) and 2) APE D62 (76,899 to 153,799 foot-pound), or other equivalent equipment. The variation in power for the pile driving equipment is not expected to substantively influence the SPLs produced during pile installation/removal activities (WSDOT 2005). Other factors such as pile materials and size, subsurface conditions, and propagation parameters at the project site would likely override any influence from the machinery.

Pile driving activities are scheduled to commence at the northern mooring dolphin location and then shift to installing fender piles along the interior portion from the shore outward. Marine species monitoring will be conducted during all pile driving activities. Acoustic monitoring and processing of source SPLs will be conducted for five (5) of each size of the fender piles driven. No acoustic monitoring for 30-inch steel piles is required.

2.4.2 Pile Removal and Demolition

Pile removal during the 2015/2016 production year will involve the removal of twenty (20) 84- and 66-inch concrete filled steel caissons, fifty-six (56) 16- and 24-inch concrete fender piles, thirty four (34) 13-inch concrete filled poly piles and potentially twelve (12) 30-inch steel pipe piles (Table 2-1). The Navy estimates that the contractor will conduct removal activities over fifty four (54) days at various rates depending on the types of piles removed and efficiency of the removal process. Each concrete filled steel caisson is assumed to require up to three hours of sawing with substantial time needed for divers to setup and align a diamond saw cutter to perform up to two cuts per caisson. The removal of fender and poly piles will utilize a hydraulic pile cutter to cut the piles at the mud line. The removal of the steel pipe piles associated with the temporary mooring dolphin will be removed by using the vibratory hammer or torch cut by

breaks between the sounds may be interpreted by the animals as a transient sound and may not serve the intended purpose of providing an indication that louder sounds are about to begin. The Navy consulted with NMFS regarding using a shorter waiting period (i.e. 30 seconds) and NMFS found that the Navy's reasoning was valid and accepted the requested modification. For the Fuel Pier Replacement Project, the soft starts for vibratory hammers require initial starts of 15 seconds at reduced energy followed by a 30-second waiting period. This measure is repeated two additional times. The soft starts for impact hammers require one dry fire followed by a 30-second waiting period. This procedure is repeated two additional times.

divers at the mud line. If vibratory removal of steel piles is conducted the soft start procedure will be employed.

Table 2-1. Activity Summary, Pile Driving and Demolition.

Activity/Method	Location and Timing	Estimated # of Days	Pile Type	# Piles Installed	# Piles Removed
Concrete Fender Piles	Bayward side of new pier, Nov-Dec 2015	22	24"X30"-concrete	88	
Concrete Filled Fiberglass Piles	Corners of Bayward side of new pier, Nov-Dec 2015	33	16"-round fiberglass	132	
North Mooring Dolphin Batter Piles	NBPL approx. 150 ft southwest of existing fuel pier, Oct 2015	6	30"-steel pipe	6	
Totals		61		226	
Piles cut off at mudline with pile cutter	NBPL old pier north segment-new pier footprint, Nov-Dec 2015	6 ¹	24"-square concrete fender		12
Piles cut off at mudline with pile cutter	NBPL old pier north segment, Nov-Dec 2015	12 ¹	16"-square concrete fender		44
Piles dry pulled with barge-mounted crane or cut off at mudline.	NBPL old pier north segment, Nov-Dec 2015	10 ¹	13"-poly filled with concrete		34
Cut off at mudline with diamond belt saw	NBPL old pier north segment, Nov-Dec 2015	20 ¹	7'-0" & 5-6" concrete-filled steel caisson		20
Piles vibrated out or cut off at mudline	Temp dolphin south of old pier, Sept 2016	6 ²	30"-round steel		12
Totals (see Notes)		54			120

Notes: " = inches; ' = feet; dia = diameter; # = number.

¹Concrete pile and caisson demolition/removal are estimated to require use of a hydraulic pile cutter, or a diamond saw, generating underwater sound on 48 total days. This IHA application covers work from October 8, 2015 through October 7, 2016. The subsequent IHA application would address the resumption of work in October 2016

²The 30-inch piles will be either vibratory extracted or cut at the mudline by divers using a torch.

2.4.3 Monitoring Equipment Used During Pile Driving, Removal, and Demolition-Related Activities

The following equipment will be required to conduct acoustic measurements and marine species monitoring:

- Survey boats (with elevated observation points) will include: a fixed marine radio for the Captain to monitor channel 16 and other marine channels independent of observers communicating on a dedicated channel, depth finder, measuring tape, navigational plotting equipment, and both fixed and hand-held Global Positioning System (GPS) Units. Vessels will comply with all Coast Guard regulations and be able to pass a Coast Guard safety inspection;
- Sound Level Meters (SLMs) and hydrophones (see below for further detail);
- Hearing protection for acoustic data collectors and boat operators near the source;
- Portable marine radios for the observers to communicate with the monitoring coordinator, construction contractor, and other observers;
- Cellular phones (one per boat/observing location), and the contact information for the other observers, and monitoring coordinator;
- Flags (one green, one red per boat/observing location) as back-up for radio communication;
- Nautical charts;
- Daily tide tables for the project area within San Diego Bay;
- Watch or Chronometer;
- Binoculars with built-in rangefinder and/or separate range finder – (quality 7 x 50 or better);
- Monitoring plan, IHA permit, and/or other relevant permit requirement specifications in sealed clear plastic cover;
- Tablets with marine species and acoustic databases for data collection;
- Notebook with pre-standardized monitoring Marine Mammal Observation Record forms on non-bleeding paper (e.g., Rite-in-the Rain);
- Marine mammal identification guides on waterproof paper;
- Clipboard; and
- Pen / Pencil.

Sound data acquisition during fender pile driving will utilize a combination of equipment used during previous monitoring efforts (Table 2-2). DSG-Ocean (Loggerhead) acoustic data loggers will be the primary equipment used for hydroacoustic measurements throughout production pile driving and ambient data collection. Loggerheads will be deployed by Marine Mammal

Observers (MMOs) or Acoustic Technicians (ATs) at the appropriate locations prior to construction activities. An acoustic monitoring location at source (10 m [33 ft]) will be deployed to document source SPLs and include a DSG-ocean acoustic data logger (Loggerhead) fitted with a single hydrophone (HTI-96-min).

Table 2-2. Acoustic Monitoring Equipment.

Item	Make	Model
DSG-ocean acoustic data logger	Loggerhead	DSG-Ocean
Hydrophone (Loggerhead® DSG-Ocean)	HTI	96-min
Hydro DB Real Time SLM	UW (custom)	
Hydrophone (Hydro DB SLM)	HTI	96-min
Sound Level Meter	Larson Davis	LD 831
Microphone	PCB	377B02
Preamplifier for Microphone	PCB	PRM 831
Pistonphone, HI Pressure	ETMC Technologies	42AC

Acoustic technicians will provide real-time monitoring of rms SPL values during initial acoustic validation measurements if Level A injury thresholds are anticipated to occur. The Hydro DB real-time Underwater Sound Level Meter (USLM) will be used to document rms SPLs at both near field and far-field locations for both impact and vibratory pile driving events. Recordings from Loggerheads and the Hydro DB USLM will be compared for consistency. All monitoring systems will deploy hydrophones at mid-depth at each station. The Larson Davis (LD) 831 Class 1 integrated SLM will be used to record and observe airborne SPLs. The LD 831 is equipped with data logging firmware capable of recording a variety of metrics including $LZ_{F_{max}}$ (rms value), and LZ_{eq} (1sec, Sound Exposure Level [SEL] value) for each recorded event. LD 831 SLMs with detachable LD microphones will be placed on tripods to collect airborne sound levels at source (15 m [50 ft]) to validate previously reported source SPLs to maintain established airborne marine mammal ZOIs.

Fender pile driving and removal activities are not expected to exceed SPLs of 180 dB rms. The Hydro DB USLM will be used to validate the SPL thresholds at the initiation of fender pile production.

All hydrophones, microphones, and recording systems will be checked prior to deploying to ensure proper operation. All sensors, signal conditioning equipment, and sampling equipment will be calibrated at the start of the monitoring period to National Institute of Standards and Technology (NIST) standards.

3 ACOUSTIC MONITORING

3.1 Objectives

The primary purpose of acoustic monitoring during 2015/2016 IHA period is to validate source and far-field acoustic measurements for the existing pile driving, pile removal and demolition activities as well as new activities such as fender pile driving and pile removal and demolition of various size piles. This validation will allow us to verify previously measured Level A (injury) and Level B (behavioral disturbance) thresholds for marine mammals and wildlife species. These zones are defined by thresholds established by NMFS. Each zone encompasses the area within the underwater or airborne isopleths. The Navy has committed to a shutdown of pile driving when any marine mammal or green sea turtle is present within the defined Level A zone. See definitions below:

a. Level A (injury) Zones:

i. Underwater

The underwater Level A zone includes the area within the 180 dB rms² isopleth for cetaceans; and within the 190 dB rms isopleth for pinnipeds and green sea turtles.

ii. Airborne

There is no airborne injury threshold for marine mammals; only a behavioral disturbance threshold discussed below.

b. Level B (behavioral disturbance) Zones:

i. Underwater

The behavioral disturbance zone includes the area within the 160 dB rms isopleth for marine mammals during impact pile driving, and the 120 dB rms isopleth for marine mammals during vibratory pile driving; the latter may be adjusted upward based on ambient sound levels that exceed the threshold, subject to concurrence from NMFS.

ii. Airborne

The distance to marine mammal disturbance thresholds will be measured. These are currently 90 dB re 20μPa (unweighted) for harbor seals and 100 dB re 20μPa (unweighted) for all other pinnipeds. Shutdowns are not required within the airborne zones.

² For impact pile driving, rms is calculated over the period of the pulse that contains 90% of the acoustical energy (typically the time interval between 5 percent and 95 percent). For vibratory pile driving, rms refers to the SPL of the signal averaged over 10 seconds of continuous operation.

3.2 Methods

The acoustic component of this monitoring plan was developed by the Navy, taking into consideration the logistical, environmental, and security requirements for working in the project area. During activities associated with the 2015/2016 IHA, acoustic monitoring (both airborne and hydroacoustic) will be used to document distances to regulatory thresholds determined from measurements collected and reported during the last two monitoring years of this project. Any recorded variations in the distances to regulatory thresholds determined from hydroacoustic and airborne measurements collected during 2015/2016 production will be presented to NMFS for concurrence to amend marine species monitoring locations. Approved and adopted changes to threshold distance would be implemented for the remainder of in-water construction activities and for the subsequent development of future IHAs. The methods described below were specifically designed to address these issues. In conjunction with measurements of SPLs at the source (as measured 10 m [33 ft] from the sound source), there will also be an attempt to verify the 120 dB during caisson removal (there will be no vibratory hammer activities during fender pile driving) and 160 dB rms thresholds for impact pile driving at the initiation of the IHA period. Full reporting metrics will be developed for the first five (5) piles of each new set of piles (24 X 30 in concrete and 16 in concrete filled fiberglass fender piles) not previously analyzed in during this Project. All acoustic monitoring stations will be located per NMFS (2012).

Empirical acoustic monitoring data will be used to validate source and transmission loss values for concrete fender piles and caissons as determined from measurements collected during the 2014/2015 production pile driving year. Underwater acoustic monitoring will use the loggerhead DSG-Ocean acoustic data logger as the primary data collection device, implement a more intermittent calibration protocol, and amend reporting metrics to those agreed upon in the second year IHA (Navy 2014), through collaboration between Dr. Peter Dahl of University of Washington and NMFS headquarters.

3.2.1 Acoustic Data Collection

3.2.1.1 Data Collection

When acoustic data is collected, one to three hydroacoustic and one airborne monitoring stations will be located at various distances away from the in-water construction activities (Figure 3-2):

3.2.1.1.1 30-inch Piles at the Northern Mooring Dolphins

- No acoustic data will be collected during the pile driving of the 30-inch steel piles. Acoustic data collected during the IPP and 2014/2015 Production Pile Driving for 36-inch steel pipe piles will be used to conservatively implement distances to Level A/B thresholds (see Table 3-2 for monitored distances); and
- One airborne sound monitoring station 15 m (50 ft) from the source.

3.2.1.1.2 Concrete and Fiberglass Fender Pile Driving, Removal and Demolition Activities

- The Navy will conduct acoustic monitoring for fender pile driving, pile removal, and demolition activities that utilize equipment and/or methods not previously evaluated. Source levels will be recorded during removal activities conducted adjacent to the fuel pier. Depending on the removal activity, the sound source may be categorized as vibratory or impact and data collection will be primarily conducted using the Hydro DB USLM and placement of the hydrophone will be adjusted to minimize obstructions. One hydroacoustic monitoring location will be at 10 m (33 ft) from the source for the impact pile driving installation of five (5) of each fender pile size (16- and 24-inch), and removal activities conducted adjacent to the fuel pier;
- The Hydro DB USLM will be used to validate source SPLs and 160 and 120 dB rms ZOIs as documented from previous the previous year's pile driving data, data collected during the IPP acoustic data measurements or data provided by the CALTRANS and WASDOT Compendium;
- Source SPLs for all construction or demolition activities will be measured for the first five events of each size or type of pile or activity indicate if source unexpectedly exceeds thresholds, we would then conduct additional monitoring to indicate isopleth distance s for the remainder of the specific activity; and
- One airborne sound monitoring station 15 m (50 ft) from the source.

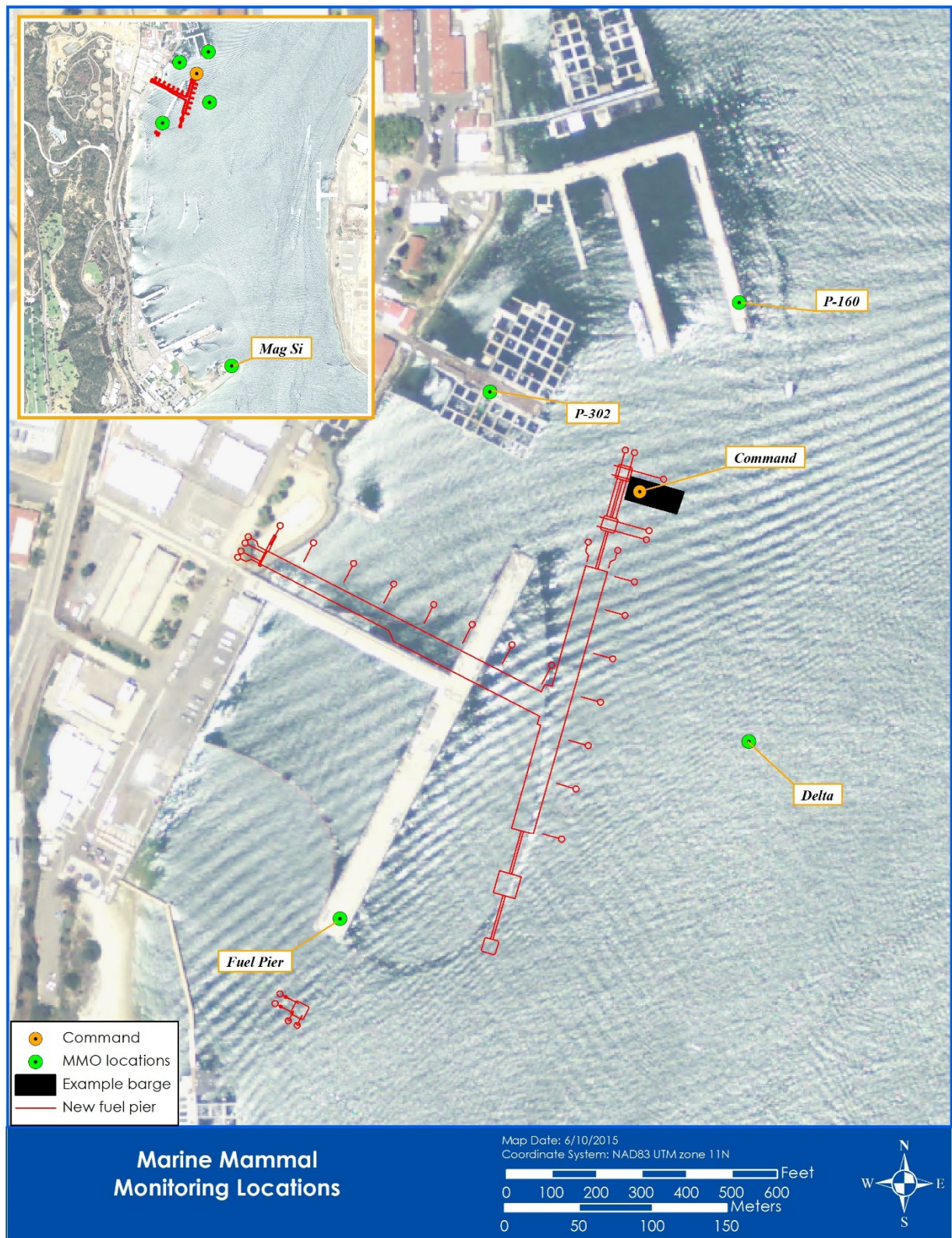


Figure 3-1. Marine Mammal Monitoring Locations (30-inch batter piles).

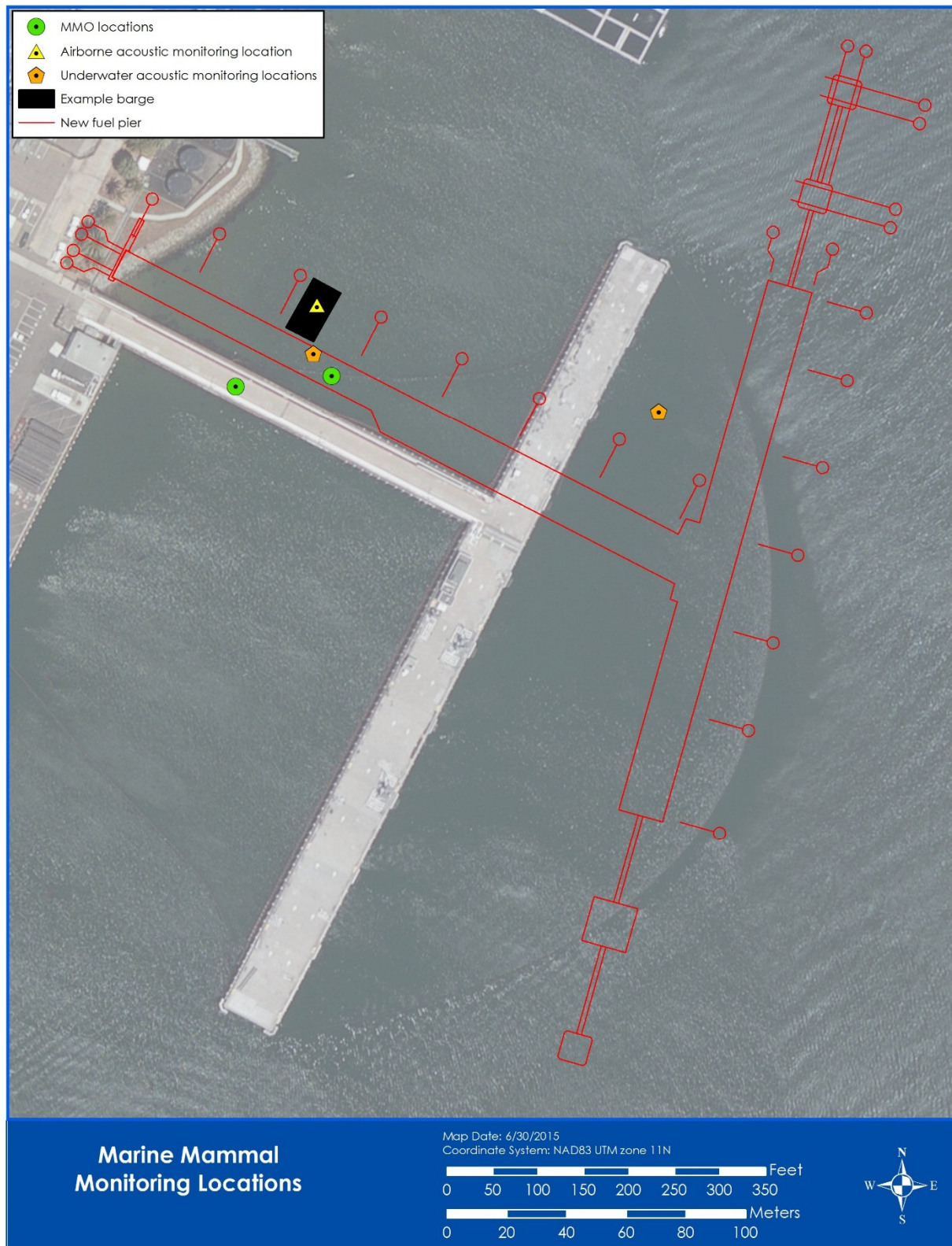


Figure 3-2. Marine Mammal and Acoustic Monitoring Locations (Fender Piles and Removal Activities).

1 Vessel-based platforms will be utilized opportunistically to allow for acoustic measurements to
2 be collected at multiple locations based on the type and location of in-water construction
3 activities. The exact locations will vary depending on whether impact or vibratory driving or
4 removal is occurring. The number, locations, and methods of deployment will vary based on the
5 targeted isopleths, measured results, and local knowledge of suitable locations that avoid conflict
6 with Naval or civilian activities.

7 Impact pile driving is treated as an impulsive sound source, in that it provides definitive peaks in
8 SPL over a given time frame. The Hydro DB USLM will provide the capability to observe real-
9 time estimates of peak, rms, and SEL SPLs for each individual pile driving event. The real-time
10 display of rms SPLs observed from the Hydro DB system will be used in the field to validate
11 expected SPLs, determine Level A/B threshold distances, and refine monitoring locations. For
12 vibratory pile driving, which is treated as a continuous sound source, source levels measured
13 during the IPP and 2014/2015 production pile driving documented that peak SPLs never
14 exceeded 180 dB rms. For vibratory removal activities the Hydro DB system will be set to record
15 and analyze vibratory SPLs. The results will be evaluated to validate expected SPLs, determine
16 Level B threshold distance, and refine monitoring locations.

17 Airborne sound source measurements will only be taken at 15 m (50 ft) from the source to
18 document that maximum SPLs documented during production pile driving are not exceeded,
19 thereby also ensuring that previously established airborne ZOIs would not be exceeded thereby
20 also ensuring that the previously established airborne ZOI's would not be exceeded For the
21 purposes of this monitoring year, the pinniped airborne harassment threshold of 100 dB re 20
22 μ Pa rms (unweighted) for sea lions will be conservatively 80 m (262 ft) and the 90 dB re 20 μ Pa
23 rms (unweighted) for harbor seals will be 233 m (764.4 ft). These monitoring distances were
24 established based on airborne SPLs from impact pile driving of 36-inch steel pipe piles as
25 reported in the 2013/2014 monitoring report (NAVFAC SW 2014). Airborne acoustic source
26 measurements will be made for several iterations of each different type of pile installation or
27 removal activity to assure source SPLs are no greater than previously documented during the IPP
28 or 2014/2015 production pile driving. Sound source levels of proposed construction activities are
29 anticipated to be significantly less than those reported during the IPP or 2014/2015 production
30 pile driving.

31 Hydrophone positions will be adjusted relative to the pile driving location to accommodate the
32 required distance and to continuously record the entire event of each pile being driven.
33 Additional systems will be deployed from anchored vessels at various locations along the
34 predicted outer limits of the injury and behavioral ZOIs for pile removal and fender pile driving
35 activities. Locations will be to the northeast and southeast of the project area.

36 Vessels will serve as marine species monitoring platforms for monitoring of pile driving of steel
37 pipe piles and during fender pile driving and removal activities, when pier based observation
38 isn't sufficient to obtain an effective vantage point. In the event that acoustic monitoring is

completed for a specific event, vessels will remain on-site for the duration of the marine mammal monitoring effort.

For acoustic recording sessions reporting of sound pressure levels and required reporting metrics will be based on continuously recorded data at source and post-processed to the appropriate frequency range. Use of the Hydro DB USLM and LD 831 SLM will be used to display an approximate real time output of the sound pressure levels received by the hydrophone or microphone and validate Level A/B threshold distances.

During all vessel-based recordings the vessel will be anchored and the engine off. Recording will be made for the duration of each individual pile. GPS positions will be logged for each recording position.

In summary, acoustic monitoring includes the following components:

- Each hydrophone (underwater) and microphone (airborne) will be calibrated at the start of the monitoring time frame and all applicable systems will be checked at the beginning of each day of monitoring activity;
- Environmental data would be collected including but not limited to: wind speed and direction, air temperature, humidity, surface water temperature, water depth, wave height, weather conditions and other factors that could contribute to influencing the airborne and underwater sound levels (e.g., aircraft, boats, etc.); and
- The monitoring coordinator will supply the acoustics specialist with the substrate composition, hammer model and size, hammer energy settings and any changes to those settings during the piles being monitored, depth of the pile being driven, and blows per foot for the piles monitored.

Hydroacoustic specific:

- For underwater recordings, SLM systems will follow methods in accordance with NMFS most recent guidance (NMFS 2012) for the collection of source levels;
- For each monitored location, a hydrophone will be deployed at mid-depth in order to evaluate site specific attenuation and propagation characteristics;
- Hydroacoustic monitoring will occur at source (10 m [33 ft]) and near the predicted ZOIs for Level B (behavioral) harassment sufficient to document ZOI distances. Hydroacoustic monitoring will be conducted for a minimum of five (5) piles of each fender pile size (16 and 24-inch), as well as for removal activities including hydraulic cutting of (16- and 24-inch) concrete fender piles, torch cutting of 30-inch steel piles, and diamond saw cutting of 66- and 84-inch caisson cutting conducted adjacent to the fuel pier. The resulting data set will be analyzed to examine and confirm sound pressure levels and rates of transmission loss for each separate in water construction activity that was not sufficiently validated during previous IHA periods. With NMFS' concurrence, these metrics will, if

needed, be used to recalculate the limits of Level A and Level B isopleths, and to make corresponding adjustments in marine mammal monitoring of these zones;

- Hydrophones will be placed at the source and ZOIs for Level B (behavioral) harassment using a static line deployed from a pier of stationary (temporarily moored) vessel. Locations of acoustic recordings will be collected via GPS. A depth sounder and/or weighted tape measure will be used to determine the depth of the water at the hydrophone deployment site. The hydrophone will be attached to a weighted nylon cord to maintain a constant depth;
- Underwater SPLs will be measured at the source for the entire duration of each recorded event if source SPLs are greater than 180 dB rms for a specific construction activity. The SPLs will be monitored in real time by observing the 90% dB rms variable on the Hydro DB rms during each pile driving event, if source SPLs are greater than 180 dB rms for a specific construction activity. Acoustic data recordings will be post-processed to determine maximum RMS SPLs. Sound levels will be measured in Pascals which are easily converted to dB;
- For acoustically monitored piles with source levels greater than 180 dB rms, identified from monitoring of each of the initial five piles of each type and activity, data from the continuously monitored source location (10 m [33 ft]) will be post-processed to obtain the maximum peak pressure level recorded for all the strikes associated with each pile, expressed in dB re 1 μ Pa. This maximum value will originate from the phase of pile driving during which hammer energy was also at maximum (referred to as Level 4.); and
- Underwater ambient conditions will be measured at the project site in the absence of construction activities to determine background sound levels. Ambient levels are intended to be recorded over the frequency range from 7 Hz to 20 kilohertz (kHz). Ambient conditions will be recorded at least three times during the IHA period consistent with current NOAA guidance (NOAA 2012). Ambient data will be collected for eight hour periods for three days during typical working hours (0700 to 1800 Monday through Saturday) in the absence of in-water construction activities.

Airborne specific:

- For airborne recordings, to the extent that logistics and security allow, reference recordings will be collected at approximately 15 m (50 ft) from the source via a sound meter with integrated microphone. Other distances may also be utilized to obtain better data if the signal cannot be clearly isolated due to other sound sources (i.e., barges or generators); and
- Airborne levels would be recorded as unweighted in dB and the distance to marine mammal behavioral disturbance thresholds would be calculated.

From all of the strikes associated with each pile occurring during the Level 4 phase, these additional measures will be made:

- mean, minimum, and maximum rms pressure level in dB re 1 μ Pa

- mean duration of a pile strike (based on the 90% energy criterion)
- number of hammer strikes
- mean, minimum, and maximum single strike Sound Exposure Level (SEL) in [dB re $\mu\text{Pa}^2 \text{ sec}$]
- cumulative SEL as defined by the mean single strike SEL + $10 \cdot \log (\# \text{ hammer strikes})$ in [dB re $\mu\text{Pa}^2 \text{ sec}$]
- A frequency spectrum (pressure spectral density) in [dB re $\mu\text{Pa}^2 \text{ per Hz}$] based on the average of up to eight successive strikes with similar sound. Spectral resolution will be 1 Hz and the spectrum will cover nominal range from 7 Hz to 20 kHz.

Furthermore, the cumulative SEL will be computed from all the strikes associated with each pile occurring during all phases (i.e., soft start, Level 1 to Level 4). This measure is defined as the sum of all single strike SEL values. The sum is taken of the antilog, with log10 taken of result to express in dB re $\mu\text{Pa}^2 \text{ sec}$.

3.2.1.2 Acoustic Monitoring Locations

During 2015/2016 production pile driving, monitoring locations will be conservatively based on acoustic data analyzed for the greatest SPLs documented during the IPP and 2014/2015 production pile driving year. For all acoustic monitoring, locations are based on the best professional judgment of the acoustics technicians in order to utilize the best positions to obtain the necessary data. The measured Level A/B (injury/behavioral) thresholds in Table 3-1 are based on data collected from 36-inch piles during the IPP and 2014/2015 production pile driving year. These distances formed the basis for all (acoustic and MMO) observation locations and are considered as conservative in that they are based on piles that are larger than the piles likely driven during 2015/2016 production pile driving timeframe. A hydrophone will be deployed only at the source (10 m [33 ft]) to measure source levels.

Table 3-1. Measured Distances to Level A (Injury) and Level B (Disturbance) Thresholds for Sound (Steel Piles).

Activity	Measured Distances to Threshold (meters [feet])					
	Underwater				Airborne ¹	
	Level A		Level B		Level B	
	190 dB	180 dB	160 dB	120 dB ²	100 dB	90 dB
Impact driving, steel piles ³	75 (246)	350 (1,148)	2,000 (6,562)	n/a	78 (256)	182 (597)
Vibratory driving, steel piles ³	10 ⁴ (33)	10 ⁴ (33)	n/a	3000 (9,483)		

Notes: ¹ Distances are based on impact pile driving with 36-inch steel piles, which is a worst-case scenario.

² The ambient sound levels in San Diego Bay are louder than 120 dB.

³ Based on 36-inch steel piles, with source levels of 174 dB rms for vibratory pile driving, and 200 dB rms for impact pile driving.

⁴ Measured values are less than 10 m (33 ft). For measured distances of less than 10 m (33 ft), the regulatory requirement is a minimum monitoring distance of 10 m (33 ft).

Considering the phased approach to the Fuel Pier construction activities, and the range and complexity necessitating monitoring of multiple sound monitoring methodologies will be employed:

- A pier-based hydrophone system will be utilized to collect acoustic data at the source (10 m [33 ft]);
- A vessel-based hydrophone system will be utilized to collect data sufficient to validate source SPLs and associated acoustic zones of influence (ZOIs).

In order to further reduce the likelihood of a Level A “take,” buffers have been added to the Level A ZOIs (Table 3-2). If an animal approaches, or enters, these buffered ZOIs, construction will be halted regardless of whether they were observed inside the actual Level A ZOIs (see Table 3-1).

Table 3-2. Monitored Distances to Level A (Injury) and Level B (Disturbance) Thresholds for Sound (Steel Piles).

Activity	Monitored ZOIs (meters [feet])					
	Underwater				Airborne	
	Level A (Buffered Shutdown ZOI)		Level B		Level B	
	190 dB	180 dB	160 dB	120 dB	100 dB	90 dB
Impact driving, steel piles	150 (492)	450 (1,804)	2,000 (6,562)	N/A	80 (262)	233 (764)
Vibratory driving, steel piles	20 (66)	20 (66)	N/A	3,000 (9,843)		

4 MARINE MAMMAL MONITORING

4.1 Objectives

The objective of marine species monitoring is to monitor for the presence of marine mammals and other protected species in San Diego Bay relative to the injury (“shutdown”) and behavioral disturbance (“buffer”) zones. In doing so, the intent is to minimize the potential impacts of the project on those species, while still allowing the project to achieve the projected construction milestones.

4.2 Methods

The marine species monitoring component of this monitoring plan was developed by the Navy, taking into consideration the logistical, environmental, and security requirements for working in the project area. During the production pile driving and removal activities, marine mammal monitoring locations will be based on the acoustic thresholds identified in NMFS (2012) and measured during the IPP and 2014/2015 production pile driving (see Figure 1-1 and Table 3-1). The ZOI boundaries determined during these phases of construction will be used to determine marine species monitoring locations for the remainder of the Fuel Pier demolition and construction. Monitoring for green sea turtles and California least terns will also occur to address the ESA-listed species most-likely to occur in the project area. The methods described below were specifically designed to address these issues.

The acoustic results presented within the monitoring report for the 2014/2015 IHA year (NAVFAC SW 2015) were used to develop the shutdown zones for pile installation activities associated with the Fuel Pier Replacement Project (see Table 3-2). The pinniped and cetacean shutdown zones include buffers to reduce the potential for Level A (injury) harassment during pile driving activities. Marine mammal monitoring will also occur for additional areas beyond the area for the Level A thresholds where sound pressure levels may cause behavioral harassment of marine mammal species. For all in-water construction and demolition activities, a minimum in-water protective shutdown zone (including a buffer) of 20 m (66 ft) is proposed.

In the event that a non-IHA marine mammal is observed by a MMO during pile driving activities, all construction will be stopped immediately. If a boat is available, MMOs will follow the animal(s) at a distance of 100 m (328 ft) until the animal has left the Level B ZOI. Pile driving will commence if the animal has not been seen inside the Level B ZOI for at least one hour of observation. If the animal is resighted again, pile driving will be stopped and a boat-based MMO (if available) will follow the animal until it has left the Level B ZOI.

During pile driving of the 30-inch pipe piles at the northern mooring dolphin, up to six MMOs will be in place to monitor the Level A/B ZOIs (see Figure 3-1 and Table 3-2). During installation of these piles, any MMO can initiate shutdown procedures by calling the monitoring coordinator (“Command”) located on the pile driving barge, who will then initiate a construction shutdown by notifying the construction crew via flag or radio.

During installation of fender piles and pile removal activities, at least two MMOs will be in place to monitor the Level A/B ZOIs (see Figure 3-2). If a shutdown is required during these construction activities, either MMO can initiate a construction shutdown by signaling the construction crew via flag or radio. While MMOs may deploy the Loggerhead acoustic data loggers, the systems will not be monitored throughout the day and the MMOs will have no other construction-related tasks while conducting monitoring.

4.2.1 Marine Species Data Collection

4.2.1.1 Marine Mammal Observer Qualifications

Monitoring will be conducted by qualified observers who will be placed at the best vantage point(s) practicable to monitor for marine species and implement shutdown/delay procedures. The following qualifications will be required of all MMOs:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface, with the ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;
- Bachelor's degree in biological science, wildlife management, mammalogy, or related field;
- Prior training and experience conducting at-sea marine mammal monitoring and/or surveys, including the identification of marine mammal behavior;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

4.2.1.2 Data Collection

The data collected during all pile installation or removal activities will not change regardless of the type and size of the pile being installed or removed. NMFS requires that at a minimum, the following information be collected by MMOs:

- Date and time that pile driving or removal begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters identified in the acoustic monitoring (e.g., wind speed and direction, air temperature);
- Tide state and water currents;
- Visibility;
- Species, numbers, and if possible sex and age class of marine mammals;
- Marine mammal behavior patterns observed, including bearing and direction of travel, and if possible, the correlation to SPLs;
- Distance from pile driving activities to marine mammals and distance from the marine mammal to the observation point;
- Locations of all MMOs;

- Other human activity in the area.

The required fields will be incorporated into paper-based and electronic forms that will be used by the MMOs. To the extent practicable, the MMOs will also record behavioral observations that may make it possible to determine if the same or different individuals are being “taken” as a result of project activities over the course of a day.

Marine mammal monitoring will take place at the same locations at which acoustic data collection is occurring. Marine species monitors will identify and document any occurrences of marine mammals, green sea turtles, or California least terns. During installation of 30-inch piles, the MMOs will be positioned at the boundaries of the applicable ZOIs and an additional observer may be added to monitor the large buffer zone between the injury and disturbance isopleths, if needed. For all other activities, acoustic technicians will be placed at varying distances to verify the Level B (160 dB rms and 120 dB rms) isopleths.

A dedicated monitoring coordinator will be on-site during all construction days. The monitoring coordinator will oversee the environmental monitoring staff, including all acousticians and MMOs. The monitoring coordinator will serve as the liaison between the environmental monitoring staff and the construction contractor to assist in the distribution of information.

The Navy will monitor the Level A and Level B ZOIs before, during, and after all pile driving and removal activities. Depending on the type of pile driving or removal, MMOs will be placed in optimal positions to record observations. Based on NMFS requirements, the Marine Mammal Monitoring Plan will include the following procedures:

- The MMOs will be located at the best vantage point(s) during in-water construction activities in order to properly see the entirety of the shutdown zones and as much of the disturbance zone as possible. The MMOs will primarily concentrate on monitoring the shutdown zones; however, monitoring of the disturbance zone will continue provided that it will not interfere with the effectiveness at sighting marine mammals in the shutdown zone. Depending on the pile location, the MMOs may be stationed on piers or docks near in-water construction activities and/or in small vessels. A monitoring coordinator will always be present on the barge associated with pile driving for 30-inch piles only. The number of marine mammal observers will vary depending on the size and complexity of the shutdown and disturbance zones, as determined by the size and type of pile (i.e., concrete and steel) being installed or removed.
- All in-water construction activities will be conducted during daylight hours (between the hours of 0700 and 1800). If lighting conditions do not allow MMOs to observe the Level A/B ZOIs effectively, construction times may be amended.
- Monitoring will be conducted before, during, and after pile driving/removal activities. Pile driving activities include the time to remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than 30 minutes.
 - During all observation periods, the MMOs will use binoculars and/or the naked eye to search continuously for marine mammals.

- Prior to the start of pile driving and/or removal activities, the shutdown and disturbance zones will be monitored for 15 minutes to ensure that driving will only commence once observers have declared the shutdown zone clear of marine mammals; animals will be allowed to remain in the shutdown zone (i.e., must leave of their own volition) and their behavior will be monitored and documented. The shutdown zone may only be declared clear, and pile driving started, when the entire shutdown zone is visible (i.e., when not obscured by dark, rain, fog, etc.). If the shutdown zones are obscured by fog or poor lighting conditions, pile driving at the location will not be initiated until that zone is visible. Should such conditions arise while pile driving is underway, the activity would be halted.
- Monitoring will take place for 30 minutes post-completion of pile driving activities.
- Observers shall record all incidences of marine mammal occurrence and behavioral observations using an approved paper-based or electronic data form.
 - Marine mammal observations shall include the following information:
 - Observer's location;
 - Location of the pile being driven;
 - Species, number of individuals (if more than one), sex, age class (if possible), distance to animal, bearing and direction of travel;
 - If acoustic monitoring is being conducted for that pile, a received SPL may be estimated, or the received level may be estimated on the basis of past or subsequent acoustic monitoring; and
 - Photographs will be taken of non-IHA species, if possible.
 - Behavioral observations may include:
 - Changing durations of surfacing and diving, number of blows (cetaceans) per surfacing, moving direction and/or speed;
 - Reduced/increased vocal activities of pinnipeds;
 - Changing/cessation of certain behavioral activities (e.g., socializing or feeding);
 - Visible startle response or aggressive behavior (e.g., tail/fluke slapping or jaw clapping);
 - Avoidance of areas where sound sources are located;
 - Flight responses (e.g., pinnipeds flushing into water from haul outs); and
 - Increased haul out time and/or changes in vocalizations (pinnipeds)
 - The following additional information should be collected on the data form:
 - Date and time that pile driving begins or ends;
 - Construction activities occurring during each observation period;
 - Weather parameters (e.g., percent cover, visibility);
 - Water conditions (e.g., sea state, tide state); and
 - Other human activity in the area
- If a marine mammal approaches or enters the shutdown zone during the course of pile driving operations, activity will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone, or 15 minutes has elapsed without a re-detection of the animal.

- For all in-water construction and demolition activities, a minimum in-water protective shutdown zone (including a buffer) of 20 m (66 ft) will be monitored.
- During non-pile driving, in-water heavy machinery work with the potential to affect marine mammals shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe work conditions if marine mammals comes within 10 m (33 ft).

To the extent practicable, the Navy will record behavioral observations that may make it possible to determine if the same or different individuals are being “taken” as a result of project activities over the course of a day.

4.2.1.3 MMO monitoring locations

In order to effectively monitor the shutdown zones, MMOs will be positioned at the best practicable vantage point(s), taking into consideration the behavior of marine mammal species likely to enter the ZOIs, security, safety, and space limitations at the NBPL waterfront. Observers may be stationed in small vessels, or on one of the piers or docks, at locations that will provide adequate visual coverage for the marine mammal shutdown and buffer zones. Marine species monitors will frequently be co-located with the acoustic monitors (see Figure 3-1 and Figure 3-2 for representative observation locations). Monitoring would be primarily dedicated to observing the shutdown zone; however, MMOs would record all marine mammal sightings beyond these distances provided it did not interfere with their effectiveness at carrying out the shutdown procedures. Figure 4-1 shows the monitored airborne and underwater Level A/B ZOIs for 30-inch piles (including buffers identified in Table 3-2) based on a representative pile location.

4.2.1.3.1 30-inch Piles at the Northern Mooring Dolphins

Up to six monitoring personnel will be used during pile driving of the six 30-inch steel piles at the northern mooring dolphins (see Figure 3-1). One staff member will be placed on the active pile driving rig in order to monitor pile driving activity and to alert the construction crew if a pile driving shutdown needs to occur due to an animal entering the shutdown zone. This crew member will focus on monitoring pile driving activity, but will act as a secondary MMO during monitoring efforts. Additionally, five land-, pier-, or vessel-based MMOs will be positioned to monitor the Level A/B ZOIs, with four of the five in close proximity to pile driving. Because there are different threshold distances for different types of marine mammals (pinniped and cetacean), the stations closest to the shutdown zone will concentrate on the Level A/B thresholds and the MMOs and vessels will be located accordingly. The MMOs associated with these platforms will record all visible marine mammal sightings. Confirmed “takes” on a per pile basis will be registered once the sightings data has been overlaid with the isopleths identified in Table 3-1, or based on refined acoustic data, if amendments to the ZOIs are needed. Boat-based acousticians may be recording SPLs in real-time, but, to avoid biasing the observations, will not communicate that information directly to MMOs. These platforms may move closer to, or farther

1 from, the source depending on whether received SPLs are less than or greater than the regulatory
2 threshold values.

3 All MMOs will be in radio communication with each other so that the MMOs will know when to
4 anticipate incoming marine mammal species and when they are tracking the same animals
5 observed elsewhere.

6 4.2.1.3.2 Concrete and Fiberglass Fender Driving, Removal and Demolition Activities

7 At least two MMOs will be utilized to monitor for marine mammals during pile installation and
8 removal activities. The MMOs will be stationed on the existing Fuel Pier and new Fuel Pier
9 trestles (see Figure 3-2) to provide the best coverage for the buffered shutdown ZOI (20 m [66
10 ft]). A 10 m (33 ft) buffer was added to the required 10 m (33 ft) monitoring area to reduce the
11 likelihood of a physical impact to marine mammals. However, based on data collected during the
12 acoustic measurements, the placement and number of the MMOs may change to better
13 accommodate any changes to the anticipated Level A/B isopleths. If source levels are measured
14 and found to be greater than, or equal to, 180 dB, monitoring protocols will be amended and
15 presented to NOAA for review and concurrence.

16 All MMOs will be in radio communication with each other so that the MMOs will know when to
17 anticipate incoming marine mammal species and when they are tracking the same animals
18 observed elsewhere.

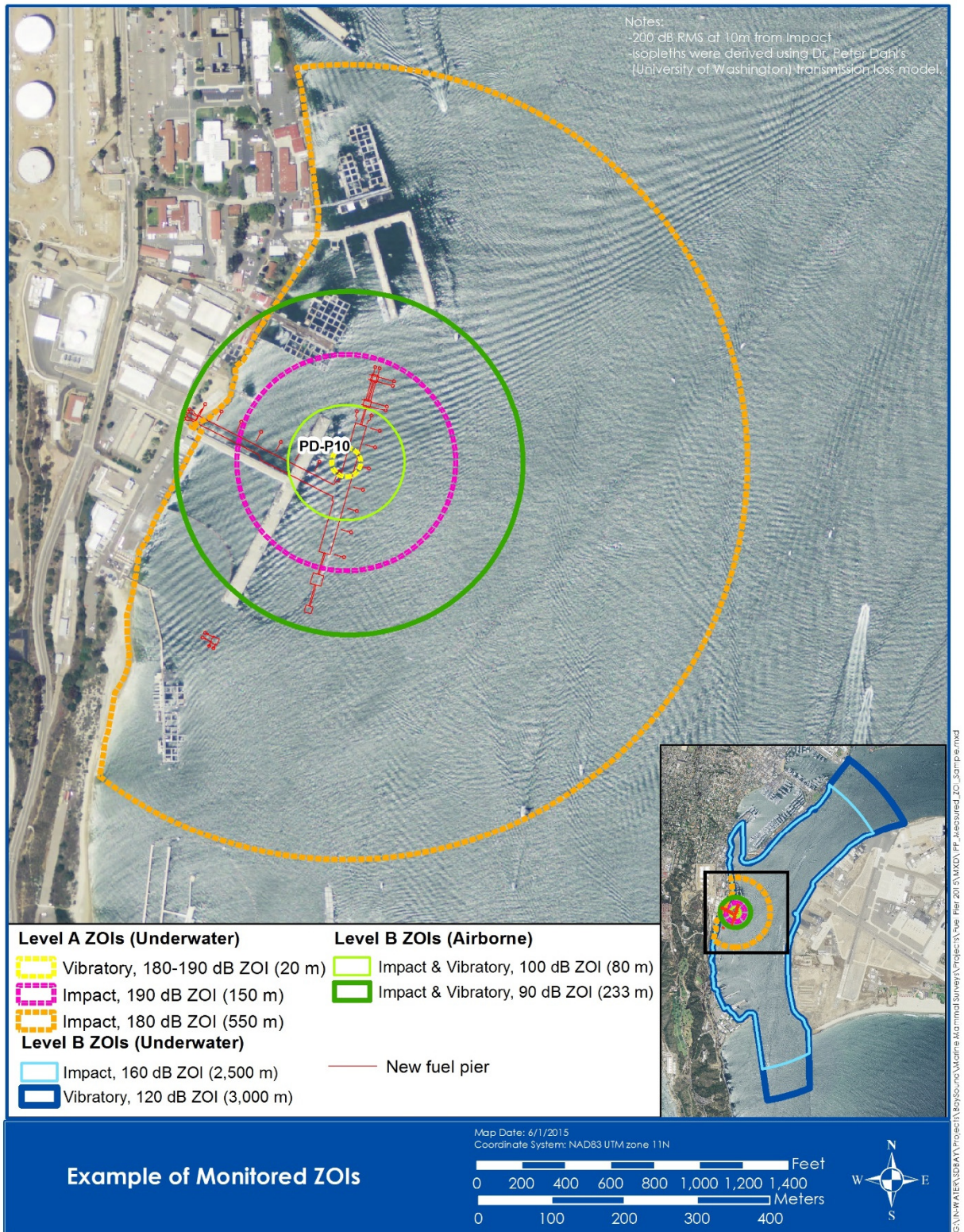


Figure 4-1. Example of the Buffered Level A (Shutdown) Zones for 30-inch piles.

5 ACTIVITIES ASSOCIATED WITH SUBSEQUENT IHAs

The Navy will apply for subsequent IHAs to cover in-water construction and demolition activities scheduled for each production year (October 8 to October 7). Construction-related activities, including production pile driving, for this IHA will start in October 2015. Activities to be monitored under subsequent IHAs will include the installation of southern mooring dolphins, removal of any remaining portions of the existing pier structure, and concrete and fiberglass-concrete fender piles. Each subsequent IHA Application will update the estimated numbers and types of piles to be installed based on the final pier design and progress made during the previous IHA period(s). Components associated with the Fuel Pier demolition/construction will be evaluated and included as part of each subsequent IHA application.

6 INTERAGENCY NOTIFICATION

The Navy anticipates that the monitoring zones may be modified as a result of acoustic data obtained during the monitoring period, and to reflect other conditions related to construction activities and marine mammal species occurrence. In the event that the Navy needs to immediately modify terms of this monitoring plan (e.g., if source levels and measured isopleths differ substantially from modeled results), a NMFS representative will be promptly contacted for discussion of the requested modification.

In addition, if the Navy finds an injured, sick, or dead marine mammal, the Navy will notify NMFS as quickly as possible. The MMO who initially sighted the animal will notify the Navy project biologist who will inform the NBPL stranding coordinator of the injured, sick, or dead marine mammal. The NBPL stranding coordinator will then notify the NMFS west coast stranding coordinator of these sightings and a decision will be made on whether to collect the animal. If the marine mammal's condition is determined to be a direct result of the project, additional notification would be made to NMFS headquarters (Ben Laws, 301-427-8425). The Navy will provide NMFS with a data sheet detailing the species or description of the animal(s), the condition of the animal (including carcass condition if the animal is dead), location, the date and time of first discovery, observed behaviors (if alive), and photo or video (if available).

Care should be taken in handling dead specimens to preserve biological materials in the best possible state for later analysis of cause of death, if that occurs. In preservation of biological materials from a dead animal, the finder (i.e. the MMO) has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed.

7 REPORTING

A draft report would be submitted to NMFS within 45 calendar days of the completion of acoustic measurements and marine mammal monitoring. The results would be summarized in graphical form and include summary statistics and time histories of sound values for each pile. A final report would be prepared and submitted to the NMFS within 30 days following receipt of comments on the draft report from the NMFS. At a minimum, the report shall include:

- General data:
 - Date and time of activities.
 - Water conditions (e.g., sea-state, tidal state).
 - Weather conditions (e.g., percent cover, visibility).
- Specific pile data for acoustically monitored piles:
 - Description of the activities being conducted.
 - Size and type of piles.
 - The machinery used for installation or removal.
 - The power settings of the machinery used for installation or removal
- Specific acoustic monitoring information:
 - A description of the monitoring equipment.
 - The distance between hydrophone(s) and pile.
 - The depth of the hydrophone(s).
 - The physical characteristics of the bottom substrate where the piles were driven or extracted (if possible).
 - Acoustic data (per Section 3 above) for each monitored pile and activity.
- Pre-activity observational survey-specific data:
 - Dates and time survey is initiated and terminated.
 - Description of any observable marine mammal behavior during monitoring.
 - If possible, the correlation to underwater sound levels occurring at the time of the observable behavior.
 - Actions performed to minimize impacts to marine mammals.
- During-activity observational survey-specific data:
 - Description of any observable marine mammal behavior during monitoring.
 - If possible, the correlation to underwater or airborne sound levels occurring at the time of this observable behavior.
 - Actions performed to minimize impacts to marine mammals.

- 1 ○ Times when pile extraction is stopped due to presence of marine mammals within the
- 2 shutdown zones and time when pile driving resumes.
- 3 • Post-activity observational survey-specific data:
- 4 ○ Results, which include the detections of marine mammals, species and numbers
- 5 observed, sighting rates and distances, behavioral reactions within and outside of
- 6 safety zones.
- 7 • A refined take estimate based on the number of marine mammals observed during the
- 8 course of construction.

8 REFERENCES

- Merkel and Associates, Inc. 2008. Marine Mammals Surveys in the Vicinity of the Point Loma Naval Complex, San Diego, California. Final Report. Prepared for NAVFAC SW. September.
- NAVFAC SW. 2014. Naval Base Point Loma Fleet Logistics Center Fuel Pier Replacement Project: Acoustic, Marine Mammal, Green Sea Turtle, and California Least Tern Monitoring Report.
- _____. 2015. Monitoring Report for Fuel Pier Replacement Project (P-151) at Naval Base Point Loma, San Diego, CA 8 October 2014 to 30 April 2015. Navy. 2013a. Incidental Harassment Authorization Application for the Navy's Fuel Pier Replacement Project at Naval Base Point Loma. Submitted to Office of Protected Resources, National Marine Fisheries Service, National Oceanographic and Atmospheric Administration. Update 1 – December 2012.
- _____. 2013b. Final Environmental Assessment, Naval Base Point Loma (NBPL) Fuel Pier Replacement and Dredging (P-151/DESC1306) San Diego, CA. Prepared by NAVFAC, June
- _____. 2014. Incidental Harassment Authorization Application for the Navy's Fuel Pier Replacement Project at Naval Base Point Loma. Submitted to Office of Protected Resources, National Marine Fisheries Service, National Oceanographic and Atmospheric Administration. June 2014.
- _____. 2015. Incidental Harassment Authorization Application for the Navy's Fuel Pier Replacement Project at Naval Base Point Loma. Submitted to Office of Protected Resources, National Marine Fisheries Service, National Oceanographic and Atmospheric Administration. June 2015.
- NMFS (National Marine Fisheries Service). 2012. Memorandum from NMFS Northwest Region and Northwest Fisheries Science Center to Interested Parties. Subject: Guidance Document: Data Collection Methods to Characterize Impact and Vibratory Pile Driving Source Levels Relevant to Marine Mammals. 31 January.
- Tierra Data, Inc. (TDI). 2014. Marine Mammal Surveys, February-April 2012. Unpublished data. Prepared under contract to NAVFAC SW. WSDOT (Washington State Department of Transportation). 2005. Underwater sound levels associated with restoration of the Friday Harbor Ferry Terminal. Prepared for Washington Department of Transportation. May 2005.